



## COURSE SYLLABUS

# Parametric Design and GIS, 7.5 credits

*Parametric Design and GIS, 7,5 högskolepoäng*

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<b>Course Code:</b> TPDR28	<b>Education Cycle:</b> Second-cycle level
<b>Confirmed by:</b> Dean Feb 1, 2017	<b>Disciplinary domain:</b> Technology (95%) and social sciences (5%)
<b>Valid From:</b> Jan 1, 2018	<b>Subject group:</b> TE9
<b>Version:</b> 1	<b>Specialised in:</b> A1N
<b>Reg number:</b> JTH2017/1907-313	<b>Main field of study:</b> Product Development

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### Intended Learning Outcomes (ILO)

After a successful course, the student shall

Knowledge and understanding

- display knowledge of concepts and methods used when automating engineering design
- show familiarity with tools and analysis to structure design tasks and design knowledge

Skills and abilities

- demonstrating the ability to write computer programs to automate simple engineering task
- demonstrating the ability to manipulate parameters and rules
- demonstrating the ability to structure design tasks and design knowledge
- demonstrating the ability to perform geospatial analysis using Geographic Information Systems (GIS) tools
- demonstrating the ability to develop simple database and to use SQL-commands

Judgement and approach

- demonstrating the ability to analyze a real design process to plan computer support and automation
- demonstrating the ability to recognize and manipulate parameters that influence the design process and results

### Contents

The use of modern computing and information technology like BIM and GIS have changed not only the means, but also the design process used in the built environment sector. A deep comprehension of digital tools and the digital information managed along the process enhances a more efficient and productive process in terms of time and quality. This course aims to give the students basic knowledge and skills to automate engineering design activities through computer programming.

The course includes the following elements:

- Representation of knowledge and reasoning (Configuration, Parametric design, Generative

systems)

- Basic programming commands
- Functions
- Object oriented programming
- Graphical programming
- Event Handling
- API-programming
- Geospatial and energy analysis and simulations
- Database and SQL

### **Type of instruction**

Lectures, exercises and assignments/project work.

The teaching is conducted in English.

### **Prerequisites**

The applicant must hold the minimum of a bachelor's degree (i.e the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits in construction engineering or civil engineering, and 15 credits in mathematics, and completed course in Introduction to Script Programming, 7.5 credits, or equivalent. Proof of English proficiency is required.

### **Examination and grades**

The course is graded 5,4,3 or Fail.

Registration of examination:

Name of the Test	Value	Grading
Examination <sup>1</sup>	3 credits	5/4/3/U
Assignments/Project work	4.5 credits	U/G

<sup>1</sup> Determines the final grade of the course, which is issued only when all course units have been passed.

### **Course literature**

Course literature consists mainly in scientific papers and web pages. All the needed literature is provided during the course and mainly in digital version.